

ENDANGERED SPECIES ASSESSMENTS

U.S. EPA OFFICE OF PESTICIDE PROGRAMS
ENVIRONMENTAL FATE AND EFFECTS DIVISION

MAY 19, 2017

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SENIOR SCIENTIST

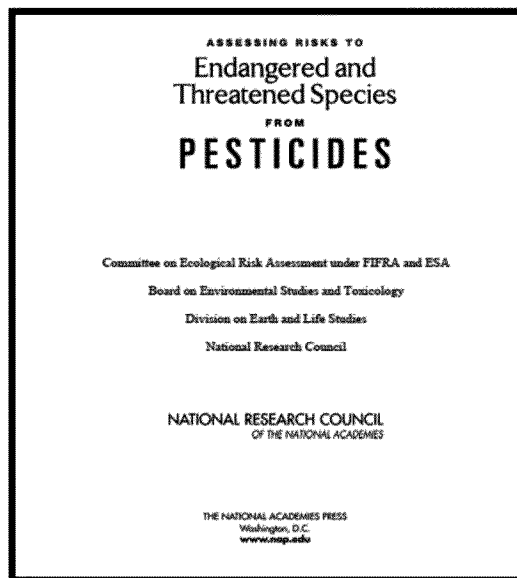
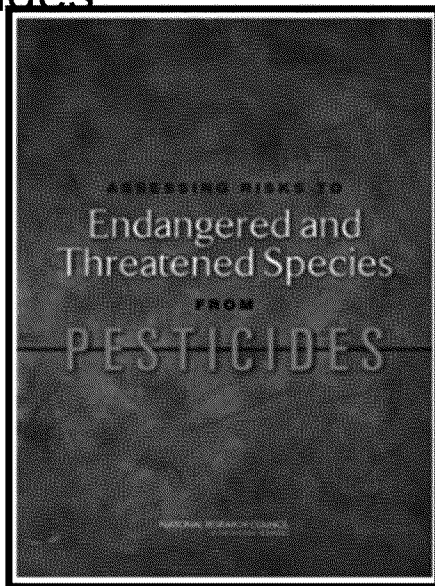


Introduction

- Endangered Species Act (ESA)
 - Section 7 requires federal agencies to consult with the Services* on actions that may affect a federally listed species
 - Section 7(a)(2) of ESA: EPA makes “effects determination” for individual listed species in a biological evaluation (BE):
 - No effect (NE) – no consultation required
 - Overview Document-compliant method (old): Risk Quotient (RQ) < listed species Level of Concern (LOC)
 - NAS-recommended method (new): No geospatial co-occurrence of pesticide use footprint with listed species range
 - Not likely to adversely affect (NLAA) – informal consultation; concurrence from Services
 - Likely to adversely affect (LAA) – formal consultation including BiOp from Services
- Conventional pesticide decisions impacted by ESA:
 - Registration review actions
 - New chemical registrations
 - New use registrations
 - Section 18 Emergency Exemptions
 - Section 24(c) Special Local Need (SLN) registrations

Introduction

- Pesticide registration that involve nationwide use on multiple sites have the potential to cause direct/indirect effects to majority of 1850 listed species
- First national-level pesticide ESA consultations
- Following the recommendations of the 2013 National Academy of Sciences' (NAS) (National Resource Council) report on assessing risks to endangered and threatened species from pesticides

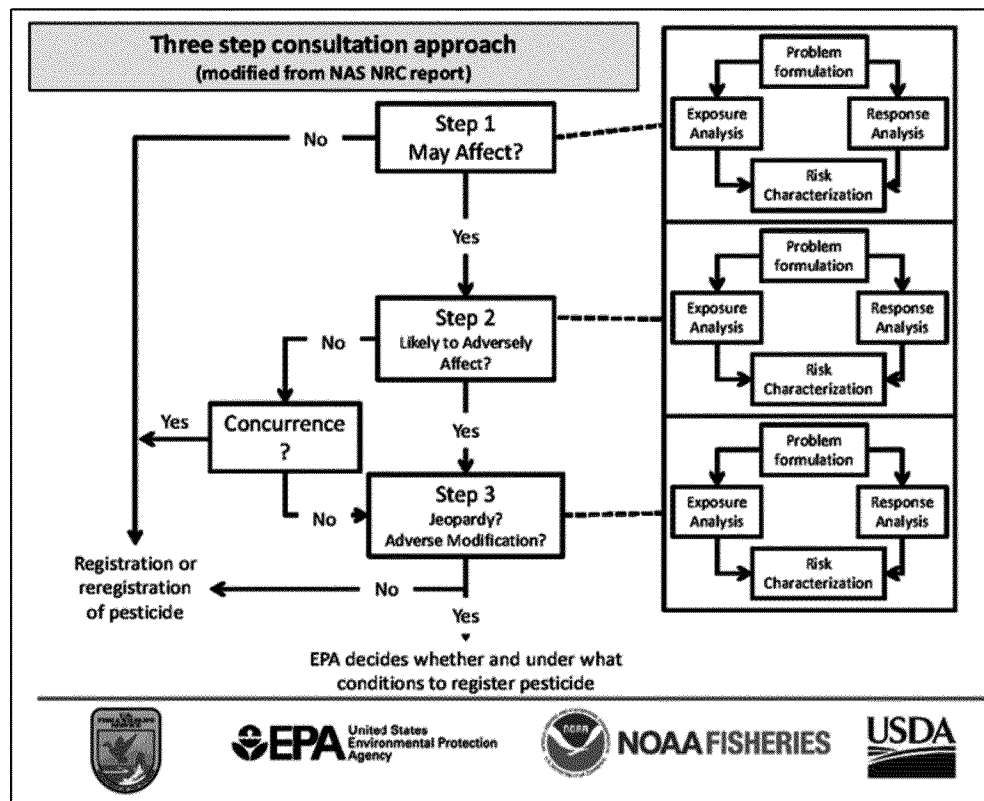


*Services = National Marine Fisheries Service and the United States Fish and Wildlife Service

Background

- Collaborative effort among the:
 - United States Environmental Protection Agency (EPA)
 - National Marine Fisheries Service (NMFS)
 - United States Fish and Wildlife Service (FWS)
 - United States Department of Agriculture (USDA)

- November 2013 – release of interim scientific methods for implementing NAS recommendations
 - <https://www.epa.gov/endangered-species/implementing-nas-report-recommendations-ecological-risk-assessment-endangered-and>
 - The draft process follows the 2013 NAS recommendations for a 3-step approach:

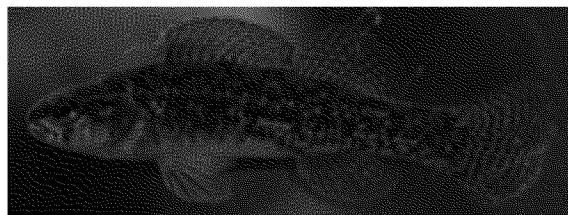
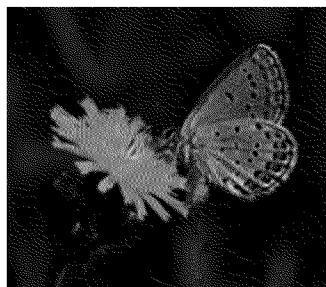
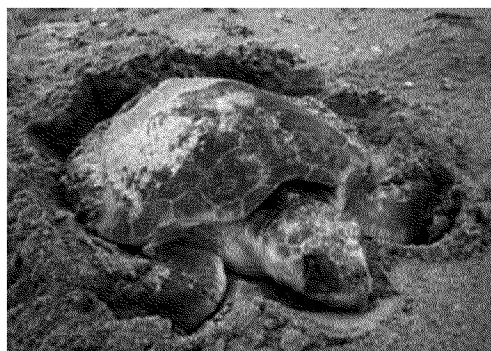


Background

- Conducted as part of EPA's Registration Review Process
 - Registration Review – the EPA periodically reviews all pesticides to ensure they meet current standards for human health and environmental safety
- Interim scientific method developed in 2013 - 2015
 - Interagency meetings and stakeholder workshops
- First “pilot” chemicals (organophosphate insecticides):
 - chlorpyrifos, diazinon, malathion
 - Public comment period 2016
- Second chemicals (carbamates insecticides)
 - carbaryl and methomyl

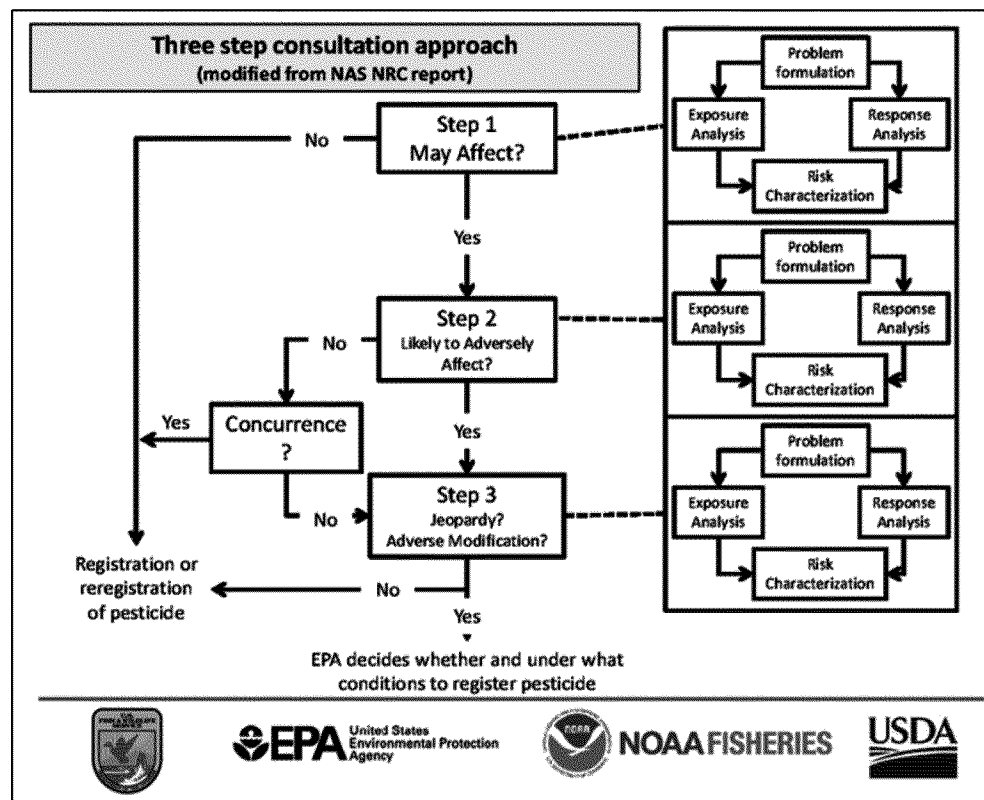
Consultation Process

- EPA's risk assessment (*i.e.*, the Biological Evaluation) that serves as the basis for the Services' Biological Opinion



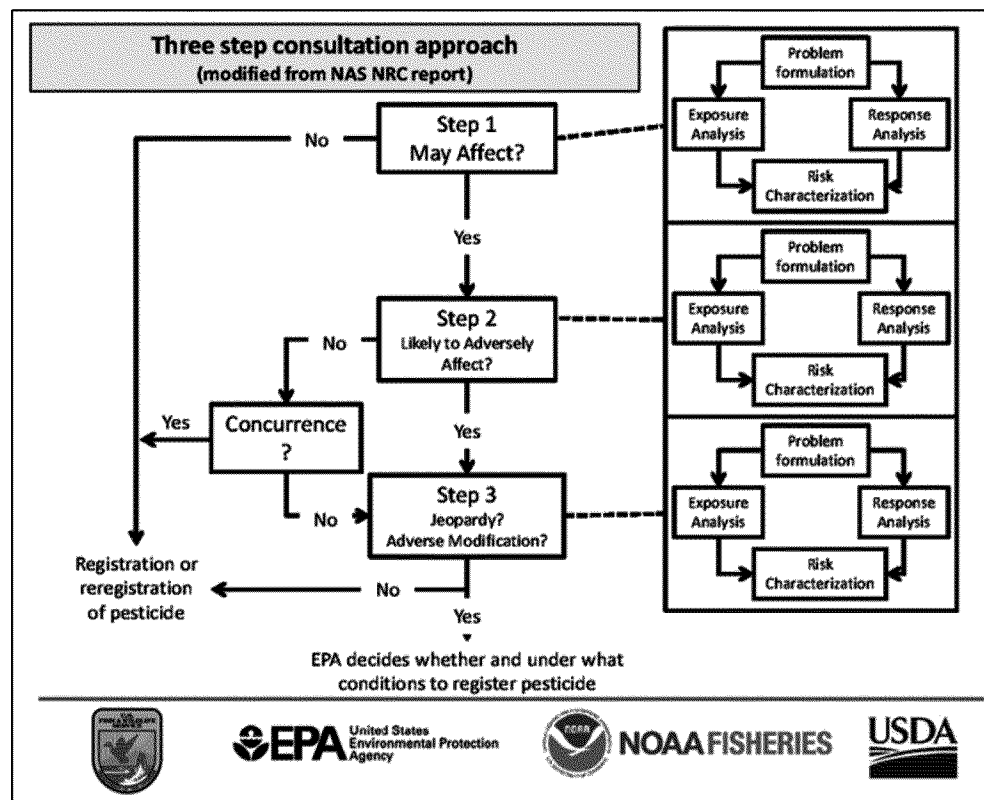
Biological Evaluation (BE)

- The BE determines whether registered pesticides adversely affect one or more individuals of a listed species and their designated critical habitats
 - Step 1** ["No Effect/May Affect" Determination]
 - Step 2** ["Not Likely to Adversely Affect (NLAA)/Likely to Adversely Affect (LAA) Determination"]



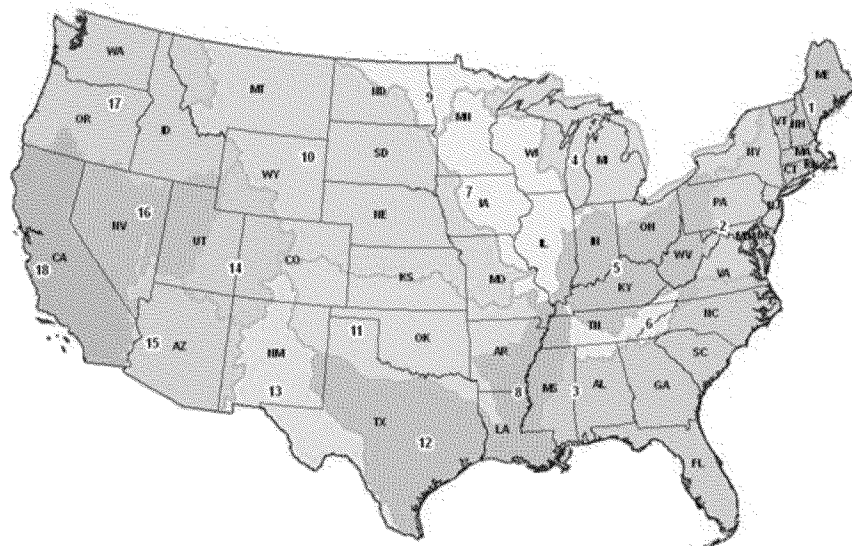
Biological Opinion (BiOp)

- The Biological Opinion (BiOp or BO) determines whether registered pesticides result in ‘jeopardy’ for a listed species or ‘adverse modification’ of designated critical habitat
 - **Step 3** [“Jeopardy/No Jeopardy” Determination and “Adverse Modification/No Adverse Modification” Determination]



Draft BE Aquatic Exposure Modeling

- Estimating aquatic exposures
 - Use current aquatic models available in EFED
 - Regional (HUC 2) scale modeling of pesticide applications to variety of waterbodies
 - 3 flowing, 3 static, and 3 estuarine/marine
 - Regional use scenarios developed by modifying existing use scenarios to reflect weather in region



HUC 2 map
of the
continental
US

Draft BE Aquatic Exposure Modeling

- Estimating aquatic exposures
 - Aquatic Bins:

Generic Habitat	Depth (meters)	Width (meters)	Length (meters)	Flow (m ³ /s)
1 – Aquatic-associated terrestrial habitats	NA	NA	NA	NA
2- low-flow	0.1	2	Length of field ¹	0.001
3- Moderate-flow	1	8	Length of field ¹	1
4- High-flow	2	40	Length of field ¹	100
5 – Low-volume	0.1	1	1	0
6- Moderate-volume	1	10	10	0
7- High-volume	2	100	100	0
8- Intertidal nearshore	0.5	50	Length of field	NA
9- Subtidal nearshore	5	200	Length of field	NA
10- Offshore marine	200	300	Length of field	NA

¹ length of field – The habitat being evaluated is the reach or segment that abuts or is immediately adjacent to the treated field. The habitat is assumed to run the entire length of the treated area.

Draft BE Aquatic Exposure Modeling

- Estimating aquatic exposures
 - Updates to tools
 - Pesticide in Water Calculator (PWC)
 - New use scenarios
 - Ability to batch run hundreds to thousands of files
 - PWC Postprocessor
 - Spreadsheet tool designed to postprocess PWC runs and generate graphs and tables to assist in making an effects determination
 - Generates:
 - Probability distribution
 - Spread of EECs by Julian date
 - Number of exceedances per month
 - Exceedance determination for each species in HUC 2 and aquatic bin

Navigating the Documents

The draft BEs (and supporting documents) can be found at: <https://www.epa.gov/endangered-species/implementing-nas-report-recommendations-ecological-risk-assessment-endangered-and>

The screenshot shows the EPA website's 'Endangered Species' section. The main heading is 'Implementing NAS Report Recommendations on Ecological Risk Assessment for Endangered and Threatened Species'. Below the heading is a 'Background' section that states: 'In 2011, the EPA and the Departments of Agriculture, Commerce and the Interior requested that the National Research Council of the National Academy of Science convene a committee of independent experts to examine topics pertaining to tools and approaches for assessing the effects of proposed FIFRA actions on endangered and threatened species and their critical habitats.' This is followed by a list of five bullet points: identifying best available scientific data, considering sub-lethal effects, assessing chemical mixtures, using models, and incorporating uncertainties. The left sidebar contains links to various topics like 'Protecting Endangered Species from Pesticides' and 'Assessing Pesticides Under the Endangered Species Act'.

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Implementing NAS Report Recommendations on Ecological Risk Assessment for Endangered and Threatened Species

Background

In 2011, the EPA and the Departments of Agriculture, Commerce and the Interior requested that the National Research Council of the National Academy of Science convene a committee of independent experts to examine topics pertaining to tools and approaches for assessing the effects of proposed FIFRA actions on endangered and threatened species and their critical habitats.

The NRC was asked to consider a range of issues, including:

- identifying best available scientific data and information;
- considering sub-lethal, indirect and cumulative effects;
- assessing the effects of chemical mixtures and inert ingredients;
- using models to assist in analyzing the effects of pesticide use;
- incorporating uncertainties into the evaluations effectively; and

Left Sidebar Links:

- Protecting Endangered Species from Pesticides
- About the Endangered Species Protection Program
- Assessing Pesticides Under the Endangered Species Act
- Endangered Species: Information For Pesticides Users
- Litigation on Endangered Species and Pesticides
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Navigating the Documents

Scroll down to find the following links:

Endangered Species

You are here: EPA Home » Endangered Species » Implementing NAS Report Recommendations on Ecological Risk Assessment for Endangered and Threatened Species

Implementing NAS Report Recommendations on Ecological Risk Assessment for Endangered and Threatened Species

NAS released its report in April 2013 with its recommendations. [Read the NAS report.](#) [Exit](#)

Status

Since receiving the NAS report, the agencies have been working together to develop shared scientific approaches that reflect the advice provided by the NAS. Working together, scientists from the requesting agencies have met, analyzed the recommendations and have developed interim approaches they will jointly implement as part of a phased iterative process. They are also identifying future tools, models and approaches that will need to be developed some time over a period of years.

[Interim Approaches for Pesticide Endangered Species Act Assessments based on National Academy of Sciences Report Recommendations](#)

EPA, in conjunction with FWS, NMFS, and USDA, has developed draft Biological Evaluations (BEs) in response to the NAS report. In December 2015, OPP released several documents associated with the Biological Evaluations (BEs) for the three pilot chemicals: chlorpyrifos, diazinon and malathion. In April 2016, EPA released the effects determination for each of the three pilot chemicals and open the docket for public comment. The information provided for each chemical will be on a separate page:

- [Chlorpyrifos](#)
- [Diazinon](#)
- [Malathion](#)
- [Provisional models](#)

2013 NAS Report

Interim Approaches

Chemical-specific BEs

Provisional Models and Tools

Scroll down

QUESTIONS

Navigating the Documents

Scroll down to find the following links:

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- [Provisional models](#)

Once a document has been opened on your computer, the text turns from blue to green

For More Information

- [Independent Science Review Sought on Endangered Species and Pesticide Issues](#)
- [NAS Report Stakeholder Workshop Presentation \(11/13/2013\)](#)
- [Endangered Species Act Implementation in Pesticide Evaluation: Interim Report to Congress \(11/2014\)](#)
- [4th Interagency Workshop on Joint Interim Approaches to NAS Recommendations \(4/2/2015\)](#)

Additional Information

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Navigating the Documents

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You are here: EPA Home » Endangered Species » Biological Evaluation Chapters for Malathion ESA Assessment

Biological Evaluation Chapters for Malathion ESA Assessment

EPA, in conjunction with FWS, NMFS, and USDA, has developed draft Biological Evaluations (BEs) in response to the National Academy of Science report on assessing risks to threatened and endangered species from pesticides. In December 2015, OPP released several documents associated with the BEs for the three pilot chemicals: chlorpyrifos, diazinon and malathion.

In April 2016, EPA released the effects determination for each of the three pilot chemicals and opened the docket for public comment. The draft BE chapters for malathion are provided below.

You may need additional software to view some of the links on this page. See [EPA's Free Viewers and Readers page](#).

- **New!** [List of document revisions since December 2015 posting \(DOCX\)](#) (3 pp, 20 K)
- **New!** [Instructions for Commenting on the Draft Biological Evaluations for Chlorpyrifos, Diazinon and Malathion \(PDF\)](#) (5 pp, 632 K)

On this page:

- **New!** [Draft Malathion Executive Summary](#)
- [Chapter 1: Draft Malathion Problem Formulation for ESA Assessment](#)
 - [Attachments](#)
 - [Appendices](#)
- [Chapter 2: Draft Malathion Effects Characterization for ESA Assessment](#)
 - [Attachments](#)
 - [Appendices](#)
- [Chapter 3: Draft Malathion Exposure Characterization for ESA Assessment](#)
 - [Attachments](#)
 - [Appendices](#)
- **New!** [Chapter 4: Draft Malathion Effects Determinations for ESA Assessment](#)
 - [Attachments](#)
 - [Appendices](#)

List of document revisions (since the Dec. 2015 posting)

Instructions for commenting on the draft BEs

Hyperlinks to location on page where you can find BE chapters and associated documents

New! = a 'new' or 'revised' document (since the Dec. 2015 posting)

Navigating the Documents

Chapter 3 (Exposure Characterization) Appendices

Appendices

- [APPENDIX 1-3: Master Use Summary Table for Malathion \(XLSX\)](#) (1 pp, 160 K)
- **New!** [APPENDIX 1-6: Use Site, General Land Cover Class, and HUC2 Matrix for Malathion \(DOCX\)](#) REVISED March 2016 (16 pp, 33 K)
- [APPENDIX 1-7: Malathion Scenario Development \(DOCX\)](#) (3 pp, 23 K)
- **New!** [APPENDIX 3-1: Environmental Transport and Fate Data Analysis for Malathion \(DOCX\)](#) REVISED March 2016 (10 pp, 40 K)
- [APPENDIX 3-2: Malathion Fate Open Literature Review \(XLSX\)](#) (1 pg, 56 K)
- **New!** [APPENDIX 3-3: Spray Drift Considerations for Malathion \(DOCX\)](#) REVISED March 2016 (10 pp, 116 K)
- **New!** [APPENDIX 3-4: Aquatic EECs \(XLSX\)](#) REVISED March 2016 (1 pp, 3.18 MB)
 - **New!** [APPENDIX 3-4f: PWC Postprocessor Output \(ZIP\)](#) (1 file, 2.7 GB)
- **New!** [APPENDIX 3-5: Malathion Downstream Dilution \(DOCX\)](#) March 2016 (1 pp, 13 K)
- **New!** [APPENDIX 3-6: Input Parameters for Weight of Evidence Matrices \(XLSX\)](#)

NOTE: Due to the size of this file for Chlorpyrifos, it needs to be saved to your computer before opening, as indicated on the web page

- **New!** [APPENDIX 3-4: Aquatic EECs \(XLSX\)](#) REVISED March 2016 (1 pp, 3.70 MB)
 - **New!** [APPENDIX 3-4f: PWC Postprocessor Output \(ZIP\)](#) **(Please save this file prior to opening)** (1 file, 3.45 GB)

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- [Malathion](#)
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Provisional Models and Tools

Navigating the Documents

Provisional models and tools can be found at:
<https://www.epa.gov/endangered-species/provisional-models-endangered-species-pesticide-assessments>

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Provisional Models for Endangered Species Pesticide Assessments

On this page:

- [Introduction](#)
- [Aquatic tools and models](#)
- [Terrestrial tools and models](#)
- [Effects tools](#)
- [Weight of Evidence \(WoE\) Tools](#)

Introduction

The tools and models on this web page were developed for use in the Steps 1 and 2 analyses of national level assessments of the risks of chlorpyrifos, diazinon and malathion to endangered and threatened species and designated critical habitat. These models are provided to allow the public access to applications of the methods described in the draft Biological Evaluations (BEs) developed for these three chemicals. A number of these tools and models have not yet completed EPA's Quality Assurance (QA)/Quality Control (QC) process; however, they are provided here in order to provide transparency and allow for submission of public comment on the tools and models that are currently being considered for use in the draft BEs for chlorpyrifos, diazinon and malathion. Unless specified below (i.e., for the Pesticides Water Calculator), these models/tools and their outputs should be considered provisional and subject to revision following the completed QA/QC process including consideration of public comment.

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